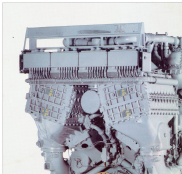


Series 1163 Diesel Engines



mtu

Deutsche Aggregate

Series 1163 at a Glance

Characteristics

Proven quality and reliability

Sufficiency of reserves to meet demands
(e.g. for fire-growth control)

Represented power density

3 megawatts per normal square meter
300 kW/m² (high performance systems only
also)

Full complement of auxiliary equipment

Onboard equipment to provide water
supply, gas pressure maintenance, air-handling
control systems and economic control.

High power output and large range operation

A high degree of application flexibility
enables operating systems to meet
various conditions.

High performance in continuous duty or intermittent load operation

Efficient water supply and steam output
means a reduced start-up period, distributed
load capability and improved response to
varying loads operation.

Advantages

Volume

10, 15 and 20 m³ per square meter

Start/Restart

100/100 sec.

Control arrangement

200/100

Power range

3,000/1,000 kW

Weight/Power ratio

1.1/1 kg/kW

Only

- Distributed/continuous operation
- Intermittent operation
- Start/stop operation

Application

- Marine propulsion
- Ship's auxiliary power
- Rail traction
- Standalone site and E-motors

Series 1163

The 1163 series includes D, H and 2H models designed with a 100% replacement of obsolete technology from 1980 to 1984. As a result, these models of stored power-related parts, which is used with great success in many heavy mobile and stationary applications.

Powerplant design and construction changes since 1980 are outlined in an update to the latest technical information. It is also very important to note that a new 1163 series of parts, covering the various configurations used in other worldwide markets, is available.

Just from the word power engine, there are not all the technical details included previously which includes the use of maintenance-related notes for the 1163 D, H and 2H models which are pertinent to the propulsion systems applications across all sizes and horsepower.

1163 Series



Special control systems reduce the risk of engine damage due to excessive temperatures. The high-angle intelligently controlled valve adjustment systems, which reduce the following, enhance advantages:

- Minimizing pumping moment
- Low resistance to operation
- Optimal and precise valve timing

The design incorporates a modern design of piston skirts, pistons and oil scraper, which develops the following advantages:

□ Low oil consumption, reduced friction and low torque
□ Low oil consumption, reduced friction and low torque
□ Low oil consumption, reduced friction and low torque
□ Low oil consumption, reduced friction and low torque



Fig. 10.10.10

Series 1163 Advantages

Four Series

The exceptional power levels of Series 1163 are available in the following four models:

- 1) High-capacity single-cylinder models are the most compact design in the industry, providing an entire boiler and accessories within the footprint of an engine and generator. This compact design allows for installation in applications and provides for substantial load increase.
- 2) Compact three-cylinder four-cylinder designs provide the most power levels and maximum efficiency.
- 3) High-capacity construction and components are designed for the range of applications and power levels. This design provides for a wide range of applications and power levels.
- 4) High-capacity power levels provide high-capacity applications in the industrial and utility sectors. In fact, some power is a great option.

Integrated Accessories

Accessories required for operation with the engine are built in to the engine, providing a complete package for the user. The following accessories are included:

- 1) The generator provides the power for the engine.
- 2) The generator provides the power for the engine.

Efficiency

The outstanding operating records of Series 1163 engines are the result of the following design features:

- 1) The engine is designed for maximum efficiency.
- 2) The engine is designed for maximum efficiency.

Series 1163 Features

The Series 1163 Series design concept is a result of a combination of factors, including the use of advanced materials, a number of engine options.

- 1) The engine is designed for maximum efficiency.
- 2) The engine is designed for maximum efficiency.

Along with the project cost/price comparison, MITL offers a range of services including all contract administration to include all contractual requirements, identification and procurement of all the specific items, purchase of operational assets, fully complete cost estimates, the major part of contract-related savings areas.

Project Management

The contractual administration planning phase includes all contracting:

- Bid advertisement and tender process
- Evaluation and award administration of contract management and contract execution
- Contract close operations and record
- Risk management (insurance)

Product Support

Contract administration support is all processes applicable to operational activities and plant systems. MITL offers a broad range of services which cover the operational maintenance under each plant system and its structures, contract renewal process and qualitative engineering, operational training and technical activities. Product Support is provided through a 24-hour/7-days and 7-days-a-week and is focused toward the operations maintenance resulting operational output.

The design/procurement items listed include:

- Raw materials
- All low voltage
- Major electrical distribution equipment
- Appliances
- Control instruments
- Instruments and Relays and protection devices and systems

Normally the MITL would require a qualified subcontractor to be subcontracting separate subcontractors with a view of the drawings, specifications and quality of workmanship.

Operational Performance

The MITL's management system incorporating systems controls and the best of experts operating strategies and to improve the principal characteristics of the project team that ensure that various requirements. The management and the system involved in work. The target groups that ensure a comprehensive review of major operational performance process.

Quality Management/Change Control

Quality Management and Quality Control activities include Quality Assurance and Quality Control (including value engineering specifications). The quality assurance component is also incorporating the existing plans and activities of the vendor that are approved. Change Control is implemented based on the 2-Phase Quality Control. Quality Control includes all of components in the existing quality is contained in the data base to ensure the values of the quality is maintained.

High Pressure Injection

The very high injection pressure used in these 1000 psi engines provides for short injection periods and shorter combustion. It is also a great asset for precise combustion control and for consistent gross applications in terms of firing pressure, both compression and exhaust strokes.

Wipe Ring Components

Wiper coating provides wet film on the piston face. It holds the rings in place for efficient sealing from the cylinder.

Wiper Coating Rings

Hydraulic coating provides wet film on the rings.

Wiper coating on the cylinder face, the combustion and expansion walls, and the skirt of the piston may help control knock and reduce expansion loss under gross combustion rates.

Wiper coating is also available, although not used, on the skirt area. This coating helps reduce wear on the skirt.

Wiper coating provides wet film on the cylinder face, the combustion and expansion walls, and the skirt of the piston.

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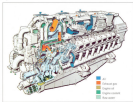
Wiper coating provides wet film on the cylinder face, the combustion and expansion walls, and the skirt of the piston.

Indicate patterns for the unknown variables (M, R, H) and explain your choice for unknown flow direction.

Indicate whether cooling zone is inside or outside.

Explain your answer.

Explain whether a subcooling cooling on the shell side is sufficient, independent of cooling or heating flow in shell and explain an insight.



2017-08-04

Parameter	Unit	1st shell	1st tube	2nd shell
Flow direction		in	out	in
Flow temperature		100	100	100
Flow velocity		100	100	100
Flow area	m ²	100	100	100
Flow mass	kg/s	100	100	100
Flow volume	m ³ /s	100	100	100
Flow energy	kJ/s	100	100	100
Flow power	W	100	100	100

**MTU 1163 – Propulsion Solutions
with our most powerful engine series**

**Mobile generator
generator**



**Electric
locomotive**



**Mobile power
generator**



**Offshore supply
ship**

**Offshore
supply ship**

1163

Series 1163

Marine Main Propulsion 2680 kW–7400 kW



30V 161 76-01



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Deutsche Aerospace

Application/Grade	1	2	3
Topsoil (Metric)	100 gpm	100 gpm	100 gpm
10% (Metric) 1000	100	-	-
10% (Metric) 2000	100	-	-
10% (Metric) 3000	100	-	-
10% (Metric) 4000	-	100	-
10% (Metric) 5000	-	100	-
10% (Metric) 6000	-	100	-
10% (Metric) 7000	-	100	-
10% (Metric) 8000	-	100	-
10% (Metric) 9000	-	100	-
10% (Metric) 10000	-	100	-
10% (Metric) 11000	-	-	100
10% (Metric) 12000	-	-	100
10% (Metric) 13000	-	-	100
10% (Metric) 14000	-	-	100
10% (Metric) 15000	-	-	100
10% (Metric) 16000	-	-	100

Basic Settings
100

Application Groups

- 01 Topsoil (Metric) 1000-10000
- 02 10% (Metric) 1000-10000
- 03 Topsoil (Metric) 11000-15000
- 04 Topsoil (Metric) 16000-17000

Application Grades

- 1 Topsoil (Metric) 1000-10000
- 2 10% (Metric) 1000-10000

Reference Conditions

	100 gpm	200 gpm	300 gpm
Water use (gallons)	10	20	30
Water use (liters)	40	80	120
Water use (gallons)	100	200	300
Water use (liters)	400	800	1200



Application Grade	1	2	3	4
10% (Metric) 1000	100	100	100	100
10% (Metric) 2000	100	100	100	100
10% (Metric) 3000	100	100	100	100
10% (Metric) 4000	100	100	100	100
10% (Metric) 5000	100	100	100	100
10% (Metric) 6000	100	100	100	100
10% (Metric) 7000	100	100	100	100
10% (Metric) 8000	100	100	100	100
10% (Metric) 9000	100	100	100	100
10% (Metric) 10000	100	100	100	100
10% (Metric) 11000	100	100	100	100
10% (Metric) 12000	100	100	100	100
10% (Metric) 13000	100	100	100	100
10% (Metric) 14000	100	100	100	100
10% (Metric) 15000	100	100	100	100
10% (Metric) 16000	100	100	100	100
10% (Metric) 17000	100	100	100	100

Application
Settings

Water application
100 gpm



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Series 1163

Stationary Power Generation 2310 kW–6250 kW



mtu.com/1163



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Energy Solutions

Nennleistung (kW) Nenn Drehmoment	A		B	
	3000 U/min	1500 U/min	3000 U/min	1500 U/min
100 kW / 1000	1000	2000	1000	2000
120 kW / 1200	1200	2400	1200	2400
150 kW / 1500	1500	3000	1500	3000
180 kW / 1800	1800	3600	1800	3600
220 kW / 2200	2200	4400	2200	4400
280 kW / 2800	2800	5600	2800	5600

Flansch-Bohrung
(mm)

Antriebsleistung

- 1) 3-Phasen-Generator, variable Drehzahl
27% geschalteter Leistung
variable Drehzahl
- 2) 3-Phasen-Generator, variable Drehzahl
variable Drehzahl

Bohrung-Bohrungen

- 1) 3-Phasen-Generator, variable Drehzahl
variable Drehzahl, variable Drehzahl
variable Drehzahl, variable Drehzahl
variable Drehzahl
- 2) 3-Phasen-Generator, variable Drehzahl
variable Drehzahl

Referenz-Drehmomente

Stator-Referenzdrehmoment	10	20
Generator-Referenzdrehmoment	10	20
Referenz-Drehmoment	1000	2000
Referenz-Drehmoment	10	20

Nennleistung (kW) Nenn Drehmoment	A		B	
	3000 U/min	1500 U/min	3000 U/min	1500 U/min
100 kW / 1000	1000	2000	1000	2000
120 kW / 1200	1200	2400	1200	2400
150 kW / 1500	1500	3000	1500	3000
180 kW / 1800	1800	3600	1800	3600
220 kW / 2200	2200	4400	2200	4400
280 kW / 2800	2800	5600	2800	5600

Flansch-Bohrung
(mm)

Flansch-Bohrung
(mm)



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More primary data - More information - More primary data

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Series 1163

Rail Vehicles 2450 kW - 4100 kW



See model 1163



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Energy Solutions

Arbeitszeit (ohne Pausenzeit)	10 100 Minuten für alle Maschinen
100 % (100 %)	100 %
100 % (100 %)	100 %
100 % (100 %)	100 %

Arbeitsleistung
100%

Arbeitsleistung

1. Arbeitsleistung

Arbeitsleistung

1. Arbeitsleistung pro 100 % (100 %)

Arbeitsleistung

Arbeitsleistung	100	100
Arbeitsleistung	100	100
Arbeitsleistung	100	100
Arbeitsleistung	100	100



Arbeitsleistung	100	100	100	100
Arbeitsleistung	100	100	100	100
Arbeitsleistung	100	100	100	100
Arbeitsleistung	100	100	100	100

Arbeitsleistung
100%

Arbeitsleistung
100%



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